PhytoKeys 69: 121–128 (2016)
doi: 10.3897/phytokeys.69.9779
http://phytokeys.pensoft.net

RESEARCH ARTICLE

A peer-reviewed open-access journal
PhytoKeys
Launched to accelerate biodiversity research

Typification of species names in *Adenocaulon* and *Eriachaenium* (Compositae/Asteraceae, Subfamily Mutisioideae, Tribe Mutisieae, Subtribe Adenocaulinae)

Vicki A. Funk[1], D. J. Nicholas Hind[2]

1 *Department of Botany, NMNH, Smithsonian Institution, P.O. Box 37012, Washington DC, 20013-7012, USA* **2** *Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE, England, U.K.*

Corresponding author: *Vicki A. Funk* (funkv@si.edu)

Academic editor: *A. Sennikov* | Received 6 July 2016 | Accepted 25 August 2016 | Published 9 September 2016

Citation: Funk VA, Hind DJN (2016) Typification of species names in *Adenocaulon* and *Eriachaenium* (Compositae/Asteraceae, Subfamily Mutisioideae, Tribe Mutisieae, Subtribe Adenocaulinae). PhytoKeys 69: 121–128. doi: 10.3897/phytokeys.69.9779

Abstract

During the course of a recent research project on *Adenocaulon* and *Eriachaenium* it became apparent that some of the species names had not been typified. In this study we located and designated as much type material as possible for these two genera. We indicate holotypes or lectotypes where appropriate, including one for the type of the genus *Adenocaulon*.

Keywords

Asteraceae, Composiate, North, Central and South America, Asia, Asia-America disjunct distribution

Introduction

In the process of preparing a manuscript on the phylogenetic placement of *Eriachaenium* Sch. Bip. and *Adenocaulon* Hook. (Funk et al. 2016) it became obvious that many names remained untypified. These two genera have interesting morphologies and distributions but until recently their affinities had never been fully understood (Funk et al. 2016) and the location of the types was not fully resolved. Tracking down the type material required assistance from herbaria in Argentina, Chile, Europe, the UK, and USA (see acknowledgements). We found as much type material as possible and when necessary we provide lectotypifications. No doubt there are isotypes and isolectotypes

Copyright *Vicki A. Funk, D. J. Nicholas Hind.* This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

that we have not located but these should be easier to find with the information we have provided (see Appendix).

The species of *Eriachaenium* and *Adenocaulon* are listed below along with their Type citations [! indicates that the specimen was seen by one of the authors and * indicates that it was seen on-line at either JSTOR-GP (continuously updated), the P website (Paris-MNHN, continuously updated), the Virtual Herbaria (continuously updated) or in some cases curators of herbaria sent photos of newly discovered type material. This newly discovered material should be available on JSTOR-GP soon. Dates for collecting trips and potential herbaria that might contain type material were taken from TL-2 (*Taxonomic Literature*, Second edition) and IH II (*Index Herbariorum*, part II) and are cited in the text appropriately. Bittmann (1990a, 1990b) studied the genus *Adenocaulon* and published a detailed study of the morphology and ecology along with a preliminary evaluation of the nomenclature including a description of a new species (Bittmann 1990a).

Taxonomy

Adenocaulon W.J. Hooker

Adenocaulon bicolor W.J. Hooker

Adenocaulon bicolor W.J. Hooker, Botanical Miscellany 1(1): 19–20. Apr 1829. Plate XV.

Syntype material. [Although the cover page of *Botanical Miscellany* volume 1 lists the publication date as 1830, according to Stafleu and Cowan (1979, page 290) it was published in three parts and part 1 (pages 1–96) was published in 1829]

Syntype 1. USA [Washington State], Dense forest of Straits of Juan de Fuca, and near Fort Vancouver and Columbia River, West coast of North America, [1824–1825], *John Scouler s.n.* [1017] [Lectotype: K! here designated; isolectotypes: E00230668*, NY00158065!; OXF* 00005489 (not yet available on JSTOR-GP)]

Scouler's trip to Northwest USA was in 1824–1825 (Vegter 1986) and the area between the Straits and Fort Vancouver and the Columbia River is in Washington State. The E specimen has "Scouler (1017)" written on it. Vegter (1986) also lists CGE as a possible location for an additional Scouler's collection but none were found (pers. comm. C. Bartram).

Syntype 2. North America, in the Rocky Mountains, [1825–1827], *Thomas Drummond s.n.* [K! (not yet available on JSTOR-GP)]

Lanjouw & Stafleu (1954) reported that Drummond's collections could also be in A, AWH, B, BM, CGE, DELS, DS, E, FI, G, G-DC, GH, GL, GOET, LD, OXF, P, PH, S, TCD, UC, UMO, UPS, US (not found), W (not found), WU]. They also said that Drummond was in North America 1825–1827 and that he made a second trip 1831–1835 but the latter trip was after the species was described. Stafleu and Cowan

(1976) report that the location of Drummond's original herbarium is unknown but indicate that BM & K have the best sets of his plants.

Adenocaulon integrifolium T. Nuttall, Transactions of the American Philosophical Society, New Series 7[1]: 289. 1841. Type material: United States, Oregon, Shady woods of the Wahlamet, near its confluence with the Oregon, [1834], *T. Nuttall, s.n.* [Holotype: GH00000615*; isotypes: K! (not yet available on JSTOR-GP); PH00224269*]

Vegter (1983) listed the date of the expedition as 1834 and said that additional material might have been sent to LIV (not found) and NY (not found). Bittmann (1990a) listed PHIL as the location of an isotype but it appears that this refers to the isotype at PH which was annotated by Bittmann (E. Benamy, pers. com.). According to Stafleu and Cowan (1981, page 786) the prologue was contained in part 1 of volume 7 and published on 12 May 1841.

Adenocaulon chilense **E.F. Poeppig ex C.F. Lessing**

Adenocaulon chilense E.F. Poeppig ex C.F. Lessing, Linnaea 6: 107–108. 1831.

Type material. Chile. Antuco, [Dec 1828], *E.F. Poeppig 225, diar. 755.* [Holotype most likely at B and destroyed; Lectotype here designated as W* (W1889-0050720); isolectotypes: G00495616*, HAL0110867*, M0029893*, P02505554*, W0064359*, & W0064360*]. Vegter (1983) listed the date of the field trip as 1827–1829 and she listed additional possible locations of herbarium material as: B, BR, CGE, F, FI-W, GOET, K, KIEL, L, LE, LZ, MO, NY, OXF, PR, PRC, US, WRSL.

Lessing's descriptions seem to be based on specimens that he examined at B. They were most likely collected by B staff/associates or sent to B as a gift/exchange. The Compositae herbarium at B was destroyed during WWII (Hiepko 1987) so when duplicates can be found they are designated as lectotypes. Lessing participated in two series of papers about Compositae in the journal *Linnaea*. The title of Lessing's first series of papers in *Linnaea* was *Synanthereis Herbarii Regii Berolinensis* (Lessing 1929, 1830a, 1830b, 1930c). The second series included two papers by Lessing (1831a, 1831b), the latter of which included the type description of *A chilense*. These two articles were part of a larger series entitled *De plantis in expeditione speculatoria Romanzoffiana observatis disserere pergunt AD. de Chamisso et D. de Schlechtendal*, and although Chamisso's original collections were no doubt at LE and Schlechtendal's at HAL they both probably sent duplicates to B and it is likely that Lessing worked from the duplicate material. Interestingly the "Romanzoffiana" treatment is part of a larger series of papers that began in volume 1 of *Linnaea* (Chamisso 1826). In his preface Chamisso (1826) says that the exploratory expeditions were supported by Count de Romanzoff the Imperial Chancellor in 1815, hence the name of the article. The preface mentions other collectors but does not mention Poeppig. Poeppig's original set is supposed to be at W

(Vegter 1983) and it is likely that a duplicate was sent to B. There are two collections at W (E. Vitek, pers. comm.) and one has been selected as the lectotype.

There is some confusion as to the collecting number: on many specimens there are two numbers, the number of the printed labels differing somewhat from the "diario" numbers that are often handwritten. As a result, some records for this particular collection have the number 755 but others list 255 (likewise JSTOR-GP entries list one or the other). Some specimens clearly have both 755 & 225 printed on the labels and others do not. It is possible that the collecting number is 755 as it appears handwritten on the lectotype (and on the printed lables as "diar. 755") and other type material has 255 printed on the labels and this may be a species number. Vitek (pers. comm.) provided an example of how the collecting number might be cited and we have followed that.

Adenocaulon lechleri C.H. Schultz Bipontinus, Flora 38: 113. 1855. Type material. Chile. Ad portum Port Famine, s.d. [1850–1853], *W. Lechler 1245* [Holotype: P02505548* ex Herb. Sch. Bip.; isotypes, BR0000005630134*, G00222157*, G00222158*, G00222159*, GH00000617*, M0029894*, M0029895*, NY00158067*, P02505546*, P02505547*, P03313093*]. On JSTOR-GP there is specimen from K from *Herbarium Hookerianum* collected by Lechler (s.n.) but with a date of 20 January 1854 and a different location. This is not believed to be type material. Chaudhri et al. (1972) gave the dates of this trip as 1850–1853.

Boerhavia nudicaulis R.A. Philippi, Linnaea 29: 37. 1857. Type material. Chile. Chillán, 1 Dec 1855, *P. Germain s.n* [Holotype: SGO000001680*; isotypes: G00414903*; K000500419!. K000500419 is not listed as a type in JSTOR-GP and the date printed on the label is '1856 et 1857", but it has the correct location and was originally identified as *B. nudicaulis* so it is probably an isotype.]

According to Lanjouw and Stafleu (1957), Germain was in Chile 1854–1890 and they indicated that there may be additional specimens at BM, F, FI, P, W and Philippi types may be at BAF (no reply).

Adenocaulon himalaicum M.P. Edgeworth

Adenocaulon himalaicum M.P. Edgeworth, Transactions of the Linnean Society of London 20: 64. 1851.

Type material. Himalaya in sylvis, 7000–9000 ft, between Nagkanda and Kotgurh [India, Himachal Pradesh], 1844, *M.P. Edgeworth 15* [Holotype: K000250901!; Probable isotypes: K! K000250901, OXF* (OXF00005487, not yet available in JSTOR-GP)].

The printed label on the Holotype has a date of 1844, the OXF sheet has the handwritten date of Oct 1840, and the K isotype has no date. TL2 (Stafleu & Cowan 1976 and Lanjouw & Stafleu 1957) indicated that an additional specimen maybe at G-DC (not found,

pers. comm. Loze). Only the K specimen has a printed label with a date and a "collecting number" so these may have been added by Kew. Since dates on these older specimens are often mixed up it seems likely that the second K specimen and the OXF specimen are isotypes.

Adenocaulon adhaerescens C.J. Maximowicz

Adenocaulon adhaerescens C.J. Maximowicz, Primitiae florae Amurensis: 152–154. 1859.

Type material. Russia, Amur, [7 July 1855], *C.J. Maximowicz s.n.*

Amur is an area in Siberia (Russia) near the border with China. Vegter (1976) indicated that Maximowicz went to Amur in 1854–1856 and again in 1859–1860 but the latter years are too late for this species description. The lectotype selected below has the date of 7 July 1855 on the label.

According to the protologue there are five syntypes all collected by Maximowicz from Amur, the Khabarovsk Region of Russia. Maximowicz worked at LE and so the material he used to describe this species should be there.

Syntype 1. Borbi (an Nadelholzrändern, 27 June fl. pr.) [Borbi, Russia: 51.24, 139.36; 14 Km SSE of Tsimmermanovka and the Amur River (Anonymous 1864)]

Syntype 2. Ussuri-Mündung [mouth of the Ussuri River], Wäldern, and especially frequent in Waldstegen, Poddale, 20 May (sterile)

Syntype 3. Chungar [Khungari River], 11 July (fl. pr.) Lectotype here designated: LE01013892* (not yet available in JSTOR-GP); Isolectotypes: H1023222*, K000768768!, S0940878*)

Syntype 4. Dshare [mouth of "Dondon" (now Anyuy) River], 18 July (flor. et frf.)

Syntype 5. Ssargu [now Sharga Lake], 14 July 1855 (fl. et defl.)

Syntype 3 was selected as the lectotype because the location, day and month are the same as those listed in the protologue. All other specimens either had no information on the actual sheet or conflicting information. Vegter (1976) listed other herbaria that might hold type material: L, NY, PU, W.

Adenocaulon lyratum S.F. Blake

Adenocaulon lyratum S.F. Blake, Journal of the Washington Academy of Sciences 24: 435–436. 1934.

Type material. Guatemala. In open woods, Chichavac, Dept. Chimaltenango, alt. 2530 m, 20 Sept 1933, *A.F. Skutch 622*, [Holotype: US00128315!; Isotypes: CAS0000062!; GH00000616*; K000500423*; LL00374377*; MICH1108850*]

Adenocaulon nepalense M. Bittmann

Adenocaulon nepalense M. Bittmann, Candollea 45: 403–405. 1990.

Type material. Nepal, Jaljale, 3400 m, 22 Aug 1984, *M. Farille & G. Lachard 847509* [Holotype: GOET000995*; isotype: G (as cited by Bittman 1990a; not found in the G herbarium, pers.comm. L. Gautier)]

Eriachaenium C.H. Schultz Bipontinus

Eriachaenium magellanicum C.H. Schultz Bipontinus

Eriachaenium magellanicum C.H. Schultz Bipontinus, Flora 38: 120–121. 1855.

Type material. Chile. Prov. Magallanes: Oazy Harbour, s.d. [1850–1853], *W. Lechler 1256* [Holotype: P04388712* ex Herb. Sch. Bip.; isotypes: K000500417!, K000500418!, P04388711*, S10-34491*]

Chaudhri et al. (1972) list the dates of this trip as 1850–1853.

Acknowledgements

We thank our colleagues at the following herbaria for their assistance in tracking down specimens that were not listed on line: CGE (C. Bartram); E (L. Scott); G (L. Gautier & L. Loze); LE (I. Illarionova & M. Legchenko); LIV (G. Reid); NY (B. Thiers & A. Weiss); OXF (S. Marner); PH (E. Benamy); and W (E. Vitek); and A. Sennikov (H), the Phytokeys subject editor, for his help with the manuscript, especially the Russian collecting localities. We apologize if we have forgotten someone. Finally, we thank the editors of the online databases that we use daily and often forget to mention: IPNI (International Plant Names Index), JSTOR Global Plants, Index Herbariorum, and the Biodiversity Heritage Library-BHL (IPNI 2012, JSTOR-GP continuously updated, Thiers continuously updated, BHL continuously updated).

References

Anonymous (1864) Index Geographicus, Being a List Alphabetically Arranged of the Principal Places on the Globe, with the Countries and Subdivisions of the Countries in which They are Situated, and Their Latitudes and Longitudes Compiled Specially with Reference to Keith Johnston's Royal Atlas. William Blackwood and Sons, Edinburgh and London, 676 pp. http://books.google.com/books?id=zJB8EM56oikC&hl=&source=gbs_api

BHL (continuously updated) Biodiversity Heritage Library. http://www.biodiversitylibrary.org

Blake SF (1934) New Asteraceae from Guatemala collected by A. F. Skutch. Journal of the Washington Academy of Sciences 24: 432–443. http://biodiversitylibrary.org/page/39918852

Bittmann M (1990a) Die Gattung *Adenocaulon* (Compositae): I. Morphologie. Candollea 45: 389–420.

Bittmann M (1990b) Die Gattung *Adenocaulon* (Compositae): II. Ökologie, Verbreitung und Systematik. Candollea 45: 493–518.

Chamisso A (1826) Praefatur – De plantis in expeditione speculatoria Romanzoffiana observatis rationem dicunt Adelbertus de Chamisso et Diedericus de Schlechtendal. Linnaea 6: 1–11. http://biodiversitylibrary.org/page/37174517

Chaudhri MN, Vegter IH, De Wal CM (1972) Index Herbariorium part II (3): Collectors I–L. Regnum Vegetabile 86: 1–473.

Edgeworth MP (1851) Descriptions of some unpublished species of plants from North-Western India. Transactions of the Linnean Society of London 20: 23–91. http://biodiversitylibrary.org/page/6208027

Funk VA, Pasini E, Bonifacino JM, Katinas L (2016) Home at last: the enigmatic genera *Eriachaenium* and *Adenocaulon* (Compositae: Mutisioideae; Mutisieae; Adenocaulinae). Phytokeys 60: 1–19. doi: 10.3897/phytokeys.60.6795

Hiepko P (1987) The collections of the Botanical Museum Berlin-Dahlem (B) and their history. Englera 7: 219–252. http://bgbm3.bgbm.fu-berlin.de/BGBM/research/englera/default.htm

Hooker WJ (1829) *Adenocaulon bicolor*. Botanical Miscellany 1(part 1), John Murray, Albemarle-Street, London, 96 pp. http://biodiversitylibrary.org/page/5172863

IPNI (2012) The International Plant Names Index. http://www.ipni.org

JSTOR-GP (continuously updated) JSTOR Global Plants. https://plants.jstor.org/

Lessing CF (1829) De Synanthereis herbarii regii Berolinensis. Dissertatio prima. Linnaea 4: 240–356. http://biodiversitylibrary.org/page/95613

Lessing CF (1830a) De Synanthereis herbarii regii Berolinensis. Dissertatio secunda. Linnaea 5: 1–42. http://biodiversitylibrary.org/page/35307123

Lessing CF (1830b) De Synanthereis herbarii regii Berolinensis. Dissertatio tertia (part 1). Linnaea 5: 237–298. http://biodiversitylibrary.org/page/35307359

Lessing CF (1830c) De Synanthereis herbarii regii Berolinensis. Dissertatio tertia (part 2). Linnaea 5: 337–365. http://biodiversitylibrary.org/page/35307459

Lessing CF (1831a) Synanthereae Rich – De plantis in expeditione speculatoria Romanzoffiana observatis disserere pergunt AD. de Chamisso et D. de Schlechtendal. Linnaea 6: 83–170. http://biodiversitylibrary.org/page/97076

Lessing CF (1831b) Synanthereae Rich – De plantis in expeditione speculatoria Romanzoffiana observatis disserere pergunt AD. de Chamisso et D. de Schlechtendal. Linnaea 6: 209–260. http://biodiversitylibrary.org/page/97202

Maximowicz CJ (1859) Primitiae florae Amurensis. Buchdruckerei der kaiserlichen Akademie der Wissenschaften, St. Petersburg, 504 pp. http://bibdigital.rjb.csic.es/ing/Libro.php?Libro=4278

Nuttall T (1841) Article XX Descriptions of new species and genera of plants in the natural order of the Compositae. Transactions of the American Philosophical Society, New Series 7(1): 283–356. http://biodiversitylibrary.org/page/36318004

Paris-MNHN (continuously updated) Muséum national d'Histoire naturelle, Paris, France. http://science.mnhn.fr/institution/mnhn/collection/p/item/search/form

Philippi RA (1857) Plantarum novarum Chilensium (Centuria Quarta). Linnaea 29: 1–47. http://biodiversitylibrary.org/page/115621

Schultz Bipontinus CH (1855) Ueber die von W. Lechler an der Magellans-Strasse gesammelten, von Hohenacker herauszugebenden Cassiniaceen, von Dr. C.H. Schultz Bipont., Hospitalarzt zu Deidesheim. Flora 38: 113–123. http://biodiversitylibrary.org/page/48763

Stafleu FA, Cowan RS (1976) Taxonomic Literature (2nd edition). Volume 1, A–G. Bohn, Scheltema & Holkema, Utrecht, 1135 pp. http://www.sil.si.edu/DigitalCollections/tl-2/

Stafleu FA, Cowan RS (1979) Taxonomic Literature (2nd edition). Volume 2, H–Le. Bohn, Scheltema & Holkema, Utrecht, 991 pp. http://www.sil.si.edu/DigitalCollections/tl-2/

Stafleu FA, Cowan RS (1981) Taxonomic Literature (2nd edition). Volume 3, Lh–O. Bohn, Scheltema & Holkema, Utrecht, 980 pp. http://www.sil.si.edu/DigitalCollections/tl-2/

Thiers B (continuously updated) Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. http://sweetgum.nybg.org/ih/

Vegter IH (1983) Index Herbariorum part II (5): Collectors N-R. Regnum Vegetabile 109: 1–803. [Bohn, Scheltema & Holkema: Utrecht/Antwerp & W. Junk, The Hague/Boston]

Vegter IH (1986) Index Herbariorum part II (6): Collectors S. Regnum Vegetabile 114: 1–985. [Bohn, Scheltema & Holkema: Utrecht/Antwerp & W. Junk, The Hague/Boston]

Virtual Herbaria (continuously updated) Virtual Herbaria. http://herbarium.univie.ac.at/database/search.php

Appendix

TYPE collections [collector(s) and number, date collected, basionym, current species name]

Drummond T., s.n., [1925–1927], ***Adenocaulon bicolor*** WJ Hooker

Edgeworth M.P., 15, 1844, ***Adenocaulon himalaicum*** Edgeworth

Farille M. & Lachard G. 847509, 22 Aug 1984, ***Adenocaulon nepalense*** M Bittmann

Germain P., s.n., 1 Dec 1855, *Boerhavia nudicaulis* Phil. = ***Adenocaulon chilense*** Lessing

Lechler W., 1245, [1850–1853], *Adenocaulon lechleri* Sch. Bip. = ***Adenocaulon chilense*** Lessing

Lechler W., 1256, [1850–1853], ***Eriachaenium magellanicum*** Sch. Bip.

Maximowicz C.J., s.n., s.d. [1854–1856], *Adenocaulon adhaerescens* Maximowicz = ***Adenocaulon himalaicum*** Edgeworth

Nuttall T., s.n., s.d. [1834], *Adenocaulon integrifolium* T Nuttall = ***Adenocaulon bicolor*** WJ Hooker

Poeppig E.F., 225 and/or 755, s.d. [1827–1829], ***Adenocaulon chilense*** Lessing

Scouler J., s.n, s.d. [1824–1825], ***Adenocaulon bicolor*** JD Hooker

Skutch A.F., 622, 20 Sep 1933, ***Adenocaulon lyratum*** SF Blake